

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph **[0038]** with the following rewritten paragraph:

[0038] The presently claimed and disclosed pmHS1 includes SEQ ID NOS:1 and 3 (nucleotide sequence) and SEQ ID NOS:2 and 4 (amino acid sequences) that have been assigned GenBank Accession Nos. AF425591 and ~~AF438904~~AF439804, respectively. The presently claimed and disclosed pmHS2 includes SEQ ID NOS:5 and 33 (nucleotide sequences) and SEQ ID NOS:6 and 34 (amino acid sequences) that have been assigned GenBank Accession Nos. AY292199 and AY292200, respectively, for pmHS2 isolated from Type A and Type D, *P. multocida*, respectively. The presently claimed and disclosed soluble pmHS1 includes SEQ ID NOS:12 and 14 (nucleotide sequence) and SEQ ID NOS: 13 and 15 (amino acid sequence). The presently claimed and disclosed single-action pmHS1 mutants include SEQ ID NOS:24 and 26 (nucleotide sequence) and SEQ ID NOS:25 and 27 (amino acid sequence). Amino acid motifs for enzymatically active heparosan/heparin synthases are disclosed in detail hereinafter.